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(54) **METHOD OF SEARCHING ADDRESS BOOK AND PORTABLE COMMUNICATION DEVICE USING THE SAME**

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(52) **U.S. Cl.**
CPC ***G06F 17/30988*** (2013.01)

(58) **Field of Classification Search**
CPC G06F 17/30988; G06F 7/06; G06F 7/08; G06F 7/24
USPC 707/752, 748, 800, 726, 999.003
See application file for complete search history.

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(57) **ABSTRACT**

A method of searching an address book and a portable communication device using the same, the method including: arranging an address book based on a character selected from information being displayed on the portable communication device; and displaying the arranged address book.

28 Claims, 6 Drawing Sheets

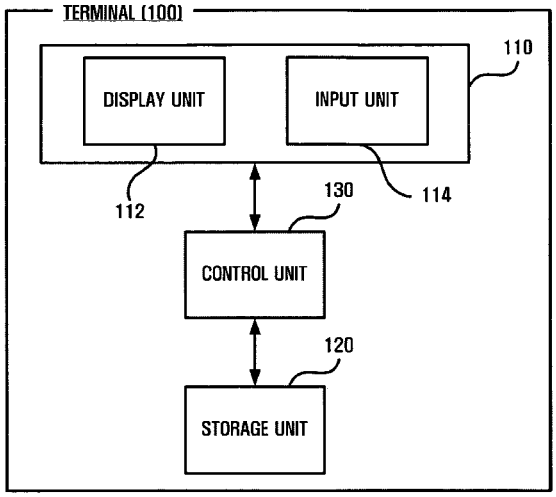


FIG. 1

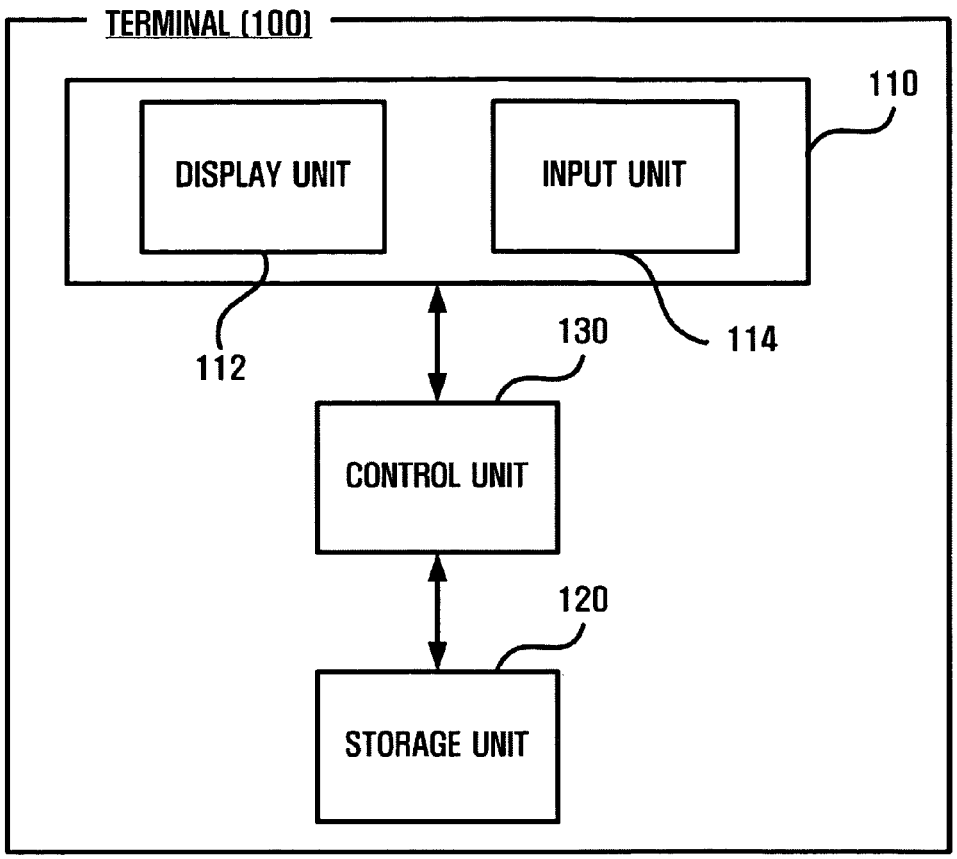

TERMINAL (100)
110
DISPLAY UNIT
INPUT UNIT
112
114
130
CONTROL UNIT
120
STORAGE UNIT

FIG. 2

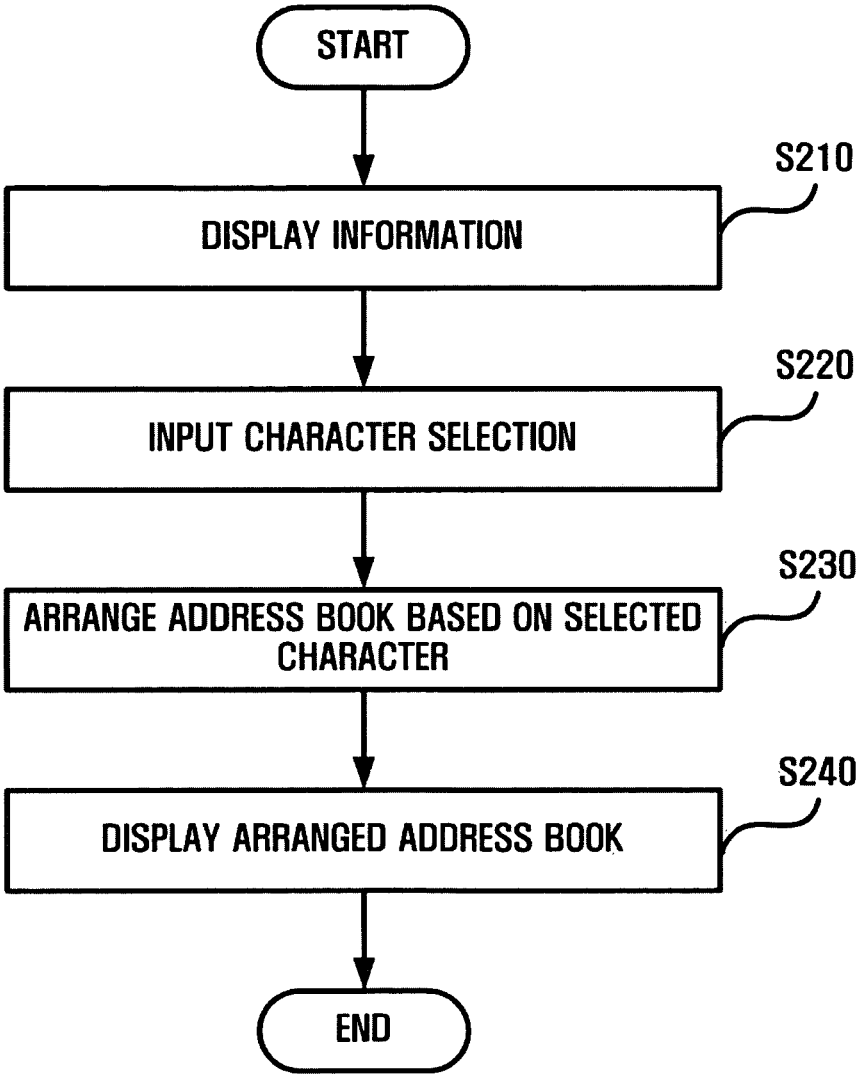

START
S210
DISPLAY INFORMATION
S220
INPUT CHARACTER SELECTION
S230
ARRANGE ADDRESS BOOK BASED ON SELECTED CHARACTER
S240
DISPLAY ARRANGED ADDRESS BOOK
END

FIG. 3

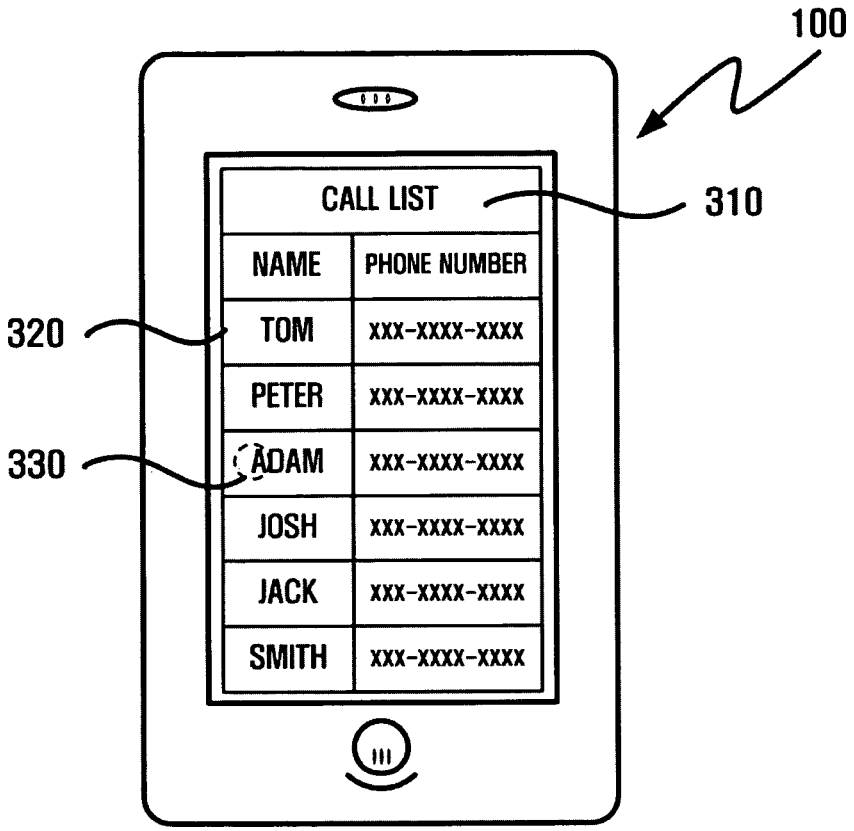

100
CALL LIST
310
NAME
PHONE NUMBER
320
TOM
xxx-xxxx-xxxx
PETER
xxx-xxxx-xxxx
330
ADAM
xxx-xxxx-xxxx
JOSH
xxx-xxxx-xxxx
JACK
xxx-xxxx-xxxx
SMITH
xxx-xxxx-xxxx

FIG. 4

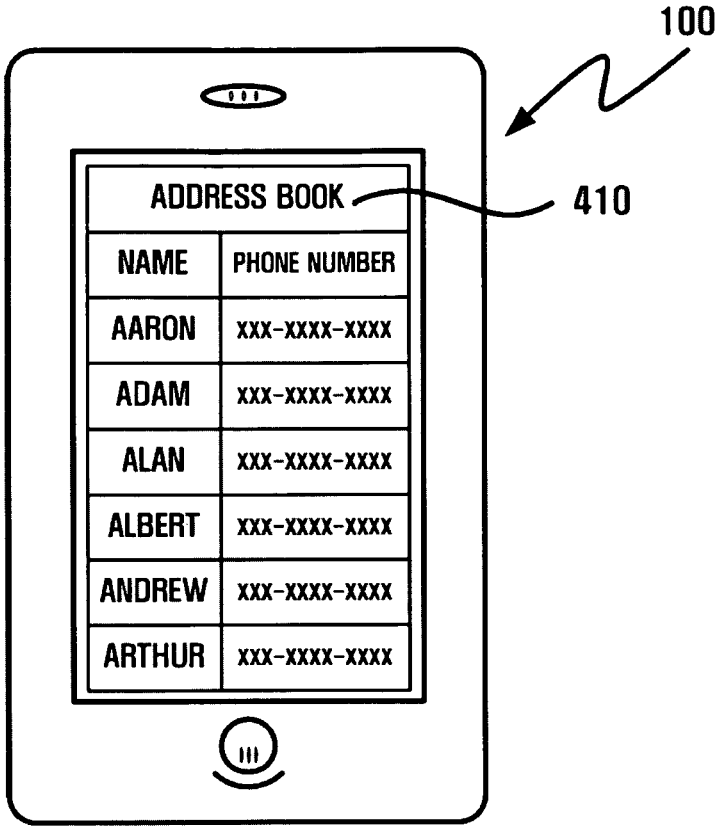

100
ADDRESS BOOK
410
NAME
PHONE NUMBER
AARON
xxx-xxxx-xxxx
ADAM
xxx-xxxx-xxxx
ALAN
xxx-xxxx-xxxx
ALBERT
xxx-xxxx-xxxx
ANDREW
xxx-xxxx-xxxx
ARTHUR
xxx-xxxx-xxxx

FIG. 5

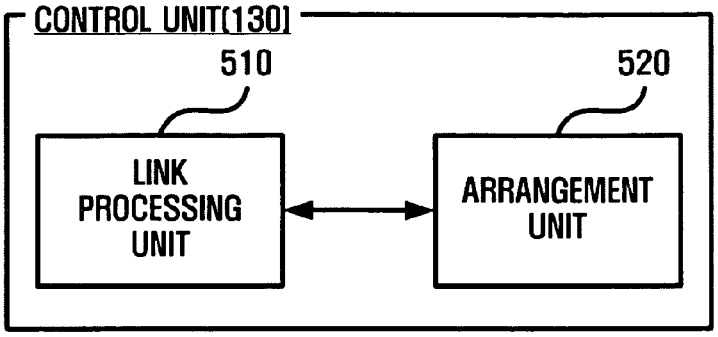

CONTROL UNIT(130)
510
520
LINK PROCESSING UNIT
ARRANGEMENT UNIT

FIG. 6

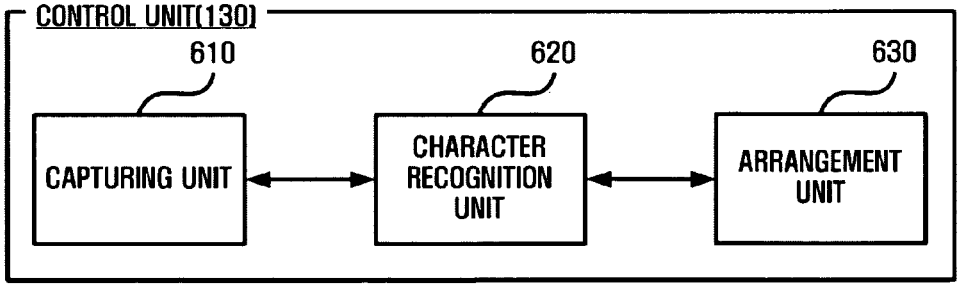
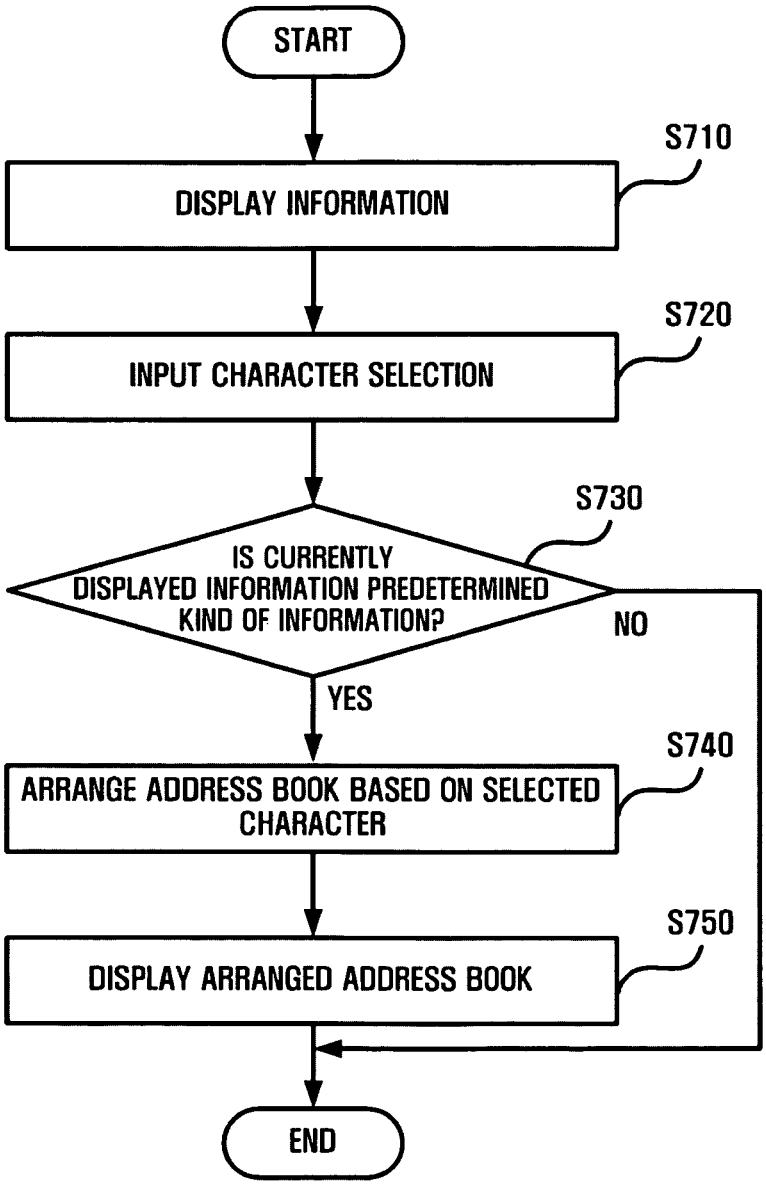

CONTROL UNIT(130)
610
620
630
CAPTURING UNIT
CHARACTER RECOGNITION UNIT
ARRANGEMENT UNIT

FIG. 7


START
S710
DISPLAY INFORMATION
S720
INPUT CHARACTER SELECTION
S730
IS CURRENTLY DISPLAYED INFORMATION PREDETERMINED KIND OF INFORMATION?
NO
YES
S740
ARRANGE ADDRESS BOOK BASED ON SELECTED CHARACTER
S750
DISPLAY ARRANGED ADDRESS BOOK
END

METHOD OF SEARCHING ADDRESS BOOK AND PORTABLE COMMUNICATION DEVICE USING THE SAME

CROSS-REFERENCE TO RELATED APPLICATION

This application claims all benefits accruing under 35 U.S.C. §119 from Korean Patent Application No. 2008-9176, filed on Jan. 29, 2008 in the Korean Intellectual Property Office, the disclosure of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

Aspects of the present invention relate to a portable communication device, and more particularly, to an address book search in a portable communication device.

2. Description of the Related Art

With the continued development of mobile communication technologies, the spread of portable communication devices (such as cellular phones, personal digital assistants (PDAs), code division multiple access (CDMA) terminals, and etc.) has increased. Furthermore, a user can input and store many phone numbers in a portable communication device, and the portable communication device provides an address book operation to search the stored phone numbers. Accordingly, direct dialing without an input of a phone number is possible.

In a conventional portable communication device providing the address book operation, a process of searching and dialing a specified phone number is performed as follows. First, a user executes a menu mode of the portable communication device by manipulating a function button or a menu button provided on the portable communication device, and selects an address book search operation by using a direction button or a numeral button. Then, the user searches for a desired phone number by scrolling the address book using the direction button or inputting a name to be searched.

The address book operation provided in the conventional mobile phone requires several button manipulations, resulting in an inconvenience to the user. In addition, as the number of stored phone numbers increases, time and effort required to search the stored phone numbers also increases.

SUMMARY OF THE INVENTION

Accordingly, aspects of the present invention provide a portable communication device and method to facilitate a search of an address book stored in the portable communication device.

Additional aspects and/or advantages of the invention will be set forth in part in the description which follows and, in part, will be obvious from the description, or may be learned by practice of the invention.

In accordance with an example embodiment of the present invention, there is provided a method of searching an address book for a portable communication terminal. Such a method includes: arranging the address book based on a character selected from information displayed on the portable communication terminal; and displaying the arranged address book.

In accordance with another example embodiment of the present invention, there is provided a portable communication device. Such a portable communication device includes a control unit to arrange an address book based on a character selected from displayed information; and a display unit having a user interface installed to provide a visual display of the arranged address book, and to enable a user to request the arranging of the address book.

In accordance with another example embodiment of the present invention, there is provided a portable communication device. Such a portable communication device includes: a control unit to arrange the address book based on a character selected from information being displayed; and a display unit having a user interface installed to provide a visual display of the arranged address book, and to enable a user to request the arranging of the address book, wherein the displayed information is an originating call list, a terminating call list, a call list including both the originating call list and the terminating call list, or the address book.

In addition to the example embodiments and aspects as described above, further aspects and embodiments will be apparent by reference to the drawings and by study of the following descriptions.

BRIEF DESCRIPTION OF THE DRAWINGS

A better understanding of the present invention will become apparent from the following detailed description of example embodiments and the claims when read in connection with the accompanying drawings, all forming a part of the disclosure of this invention. While the following written and illustrated disclosure focuses on disclosing example embodiments of the invention, it should be clearly understood that the same is by way of illustration and example only and that the invention is not limited thereto. The spirit and scope of the present invention are limited only by the terms of the appended claims. The following represents brief descriptions of the drawings, wherein:

FIG. **1** is a block diagram illustrating a construction of a portable terminal according to an example embodiment of the present invention;

FIG. **2** is a flowchart illustrating a process of searching an address book of a portable terminal according to an example embodiment of the present invention;

FIG. **3** is a view explaining a call list according to an example embodiment of the present invention;

FIG. **4** is a view explaining address book search results according to an example embodiment of the present invention;

FIG. **5** is a view illustrating a construction of a control unit of a portable terminal according to an example embodiment of the present invention;

FIG. **6** is a view illustrating a construction of a control unit of a portable terminal according to another example embodiment of the present invention; and

FIG. **7** is a flowchart illustrating a process of searching an address book according to another example embodiment of the present invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

Reference will now be made in detail to the present embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to the like elements throughout. The embodiments are described below in order to explain the present invention by referring to the figures.

FIG. **1** is a block diagram illustrating a construction of a portable terminal **100** according to an example embodiment of the present invention. The portable terminal **100** is a handheld computer or an information processing device having a data storage operation and a digital operation. Furthermore,

the portable terminal **100** may be a mobile device (such as a portable phone, a personal digital assistant (PDA), a portable multimedia player (PMP), etc.). The portable terminal **100** includes a user interface **110** and a storage unit **120**.

The user interface unit **110** performs an information transfer operation between a user and the portable terminal **100**. Specifically, the user interface **110** displays results of a data processing of the portable terminal **100**, and receives an input from a user. That is, the user can manipulate the portable terminal **100** through the user interface **110**, and confirm information (for example, that a certain operation has been performed, or the results of an operation).

The user interface **110** includes a display unit **112** and an input unit **114**. The display unit **112** may be implemented by a flat display device (such as a liquid crystal display (LCD), an organic electro luminescence display (organic EL), etc.). It is understood that the display unit **112** and the input unit **114** may not be physically separated. For example, the user interface **110** may be implemented in a manner such that the input unit **114** and the display unit **112** are organically integrated (for example, a touch screen including a touch panel and a display).

The storage unit **120** stores therein various information, such as call histories, short messages sent or received, an address book, and various kinds of information inputted in accordance with the user's request. Here, the address book includes names of calling and called parties (e.g., names of persons and/or companies) and corresponding contact points (e.g., phone numbers and/or e-mail addresses). In addition, the storage unit **120** stores programs used to perform or control various operations of the portable terminal **100** and data. For this, the storage unit **120** includes a memory, which may be a volatile memory (such as RAM) or a non-volatile memory (such as ROM, flash memory, or a hard disk drive).

The control unit **130** arranges the address book stored in the storage unit **120** based on characters selected by the user from information displayed through the user interface **110**. Specifically, the arranged address book is transferred to the user interface **110**, and the user interface **110** displays the transferred address book. In addition, the control unit **130** controls the operation of constituent elements of the portable terminal **100**.

Although not illustrated in the drawings, the portable terminal **100** may further include constituent elements used to perform various other operations. For example, in the case where the portable terminal **100** is a portable phone, the portable terminal **100** may further include a microphone, a speaker, a wireless communication unit, etc.

The elements constituting the portable terminal **100** as illustrated in FIG. **1** may be implemented by modules. In the embodiment of the present invention, the term "module", as used herein, refers to, but is not limited to, a software or hardware component, such as a Field Programmable Gate Array (FPGA) or Application Specific Integrated Circuit (ASIC), which performs certain tasks. A module may be configured to reside on the addressable storage medium and configured to execute on one or more processors. Thus, a module may include, by way of example, components, such as software components, object-oriented software components, class components and task components, processes, functions, attributes, procedures, subroutines, segments of program code, drivers, firmware, microcode, circuitry, data, databases, data structures, tables, arrays, and variables. The functionality provided for in the components and modules may be combined into fewer components and modules or further separated into additional components and modules. In addition, the components and modules may be implemented so as to execute one or more central processing units (CPUs) in a device or a security multimedia card.

Hereinafter, a method of searching an address book by using the portable terminal **100** as illustrated in FIG. **1** will be described in more detail. FIG. **2** is a flowchart illustrating a process of searching an address book of a portable terminal **100** according to an example embodiment of the present invention. Referring to FIG. **2**, the display unit **112** displays information corresponding to a current operation of the portable terminal **100** in operation S**210**. For example, the display unit **112** may display a call list **310**, as illustrated in FIG. **3**. The call list **310** may include data in which user's call information (e.g., names and phone numbers of opposite parties having made calls) is arranged in time order based on start or end time points of calls. Referring to FIG. **3**, the information (call list **310**), displayed through the display unit **112**, includes names of calling and called parties. That is, at least one character **330** is included in the information being displayed. A user who desires to search the address book can select the character **330** to be the basis of the address book search from the information being displayed through the display unit **112**.

In an embodiment of the present invention, the input unit **114** and the display unit **112** are integrated and implemented by a touch screen that is a bidirectional input device. In this case, the user can select a desired character by clicking a position where the character is displayed on a display screen of the portable terminal **100** with a pointing tool (such as a finger, a stick, a pen, etc.). On the other hand, in the case where the input unit **114** is physically distinct from the display unit **112** and is implemented, for example, by buttons, dials, and/or a touchpad, the user can select a desired character by pushing the buttons (e.g., a direction button, a function button, or a combination thereof) or by moving a cursor being displayed on the screen through dragging of the pointing tool on the touchpad.

When the input unit **114** confirms the input of a user's request for a character selection in operation S**220**, the control unit **130** arranges the address book stored in the storage unit **120** on the basis of the selected character in operation S**230**. For example, the control unit **130** searches and arranges the address book including names that start with the selected character in operation S**220**. Accordingly, if the user selects a character "A" **330** on the screen, the control unit **130** arranges the address book including the names starting with "A". However, it is understood that aspects of the present invention are not limited thereto. For example, the control unit **130** may arrange the names starting with the selected character, in addition to and preceding all other names of the address book in operation S**220**. Moreover, if there is no name starting with or including the selected character, the control unit **120** may arrange names starting with or including the closest character to the selected character in the order of characters. Alternatively, if there is no name starting with or including the selected character, the control unit **130** may output a message, displayed on a screen by the display unit **112**, to report the absence of names starting with or including the selected character.

The display unit **112** displays the arranged address book in operation S**240**. For example, if the user selects the character "A" **330** on the screen as illustrated in FIG. **3**, the portable terminal **100** arranges and displays an address book **410** that includes names starting with "A," as illustrated in FIG. **4**. Although the address book illustrated in FIG. **4** is arranged in the descending order of characters, it is understood that aspects of the present invention are not limited thereto. For example, the address book **410** that is displayed on the screen

of the portable terminal **100** may be arranged in the ascending order of characters or in another type of arrangement method.

An example of a method, in which the portable terminal **100** confirms a character selected by the user and arranges an address book in accordance with the selected character, may be a method using hypertext. In this case, the information being displayed through the display unit **112** in operation S**210** of FIG. **2** is prepared in hypertext. That is, respective characters in the information being displayed through the display unit **112** may be linked to corresponding names or instructions. For example, characters "T", "O", and "M" of the name "TOM" **320** in the call list **310** as illustrated in FIG. **3** may be linked to different names respectively starting with the corresponding characters, respectively. As an example of a link method, the character "T" may be mapped on link information, such as <herf:menu="address book" sortfrom="T" sort="descending order">, and the character "O" may be mapped on link information, such as <herf: menu="address book" sortfrom="O" sort="descending order">.

In order to use the hypertext, the control unit **130** of the portable terminal **100** includes a link processing unit **510** and an arrangement unit **520**, as illustrated in FIG. **5**. The link processing unit **510** constructs the information to be displayed through the display unit **112** in hypertext. That is, the link processing unit **510** generates link information corresponding to the respective characters of the information to be displayed, and performs mapping of the link information on the respective characters. If the user selects the character from the displayed information, the link processing unit **510** provides the link information of the selected character to the arrangement unit **520**. At this time, the control unit **520** arranges the address book in accordance with the link information provided from the link processing unit **510**, and provides the arranged address book to the display unit **112**.

FIG. **6** is a view illustrating a construction of a control unit of a portable terminal **100** according to another example embodiment of the present invention. In the example embodiment illustrated in FIG. **6**, the portable terminal **100** operates to search an address book by using a character recognition operation. For this, the control unit **130** includes a capturing unit **610**, a character recognition unit **620**, and an arrangement unit **630**.

The capturing unit **610** captures an image in a predetermined range around a point selected by the user on the screen of the portable terminal **100** (e.g., a point on the touch screen that is in contact with the pointing tool). The size of an area captured by the capturing unit **610** is predetermined to correspond to the size of the respective characters being currently displayed.

The character recognition unit **620** recognizes the character included in the image captured by the capturing unit **610**. For example, the character recognition unit **620** calculates feature data of the image transferred from the capturing unit **610**, and searches for the character having the same feature data as the calculated feature data in a specified error range. The feature data may include coordinate data and stroke data of the character. Furthermore, inherent feature data of various kinds of characters and character codes corresponding to the feature data may be stored in the storage unit **120**. An example of the character code may be an ASCII code.

The arrangement unit **630** arranges the address book based on the character recognized by the character recognition unit **620**, and provides the arranged address book to the display unit **112**.

It is understood that aspects of the present invention are not limited to the methods using the hypertext and the character recognition as described above. Accordingly, it should be understood that other methods of confirming the character selected by the user and arranging the address book based on the confirmed character are also within the scope of aspects of the present invention.

In the example embodiment of the present invention illustrated in FIG. **2**, the portable terminal **100** searches the address book irrespective of the kind of information being displayed through the portable terminal **100**. However, in the case where the portable terminal **100** is in a specified operational mode (i.e., if the portable terminal **100** displays a predetermined kind of information), the address book search operation may be operated as described above.

Time to activate the address book search operation may differ according to the kind of information being displayed. However, since there is a high probability that the user searches the address book while information related to the address book is displayed, the address book search operation may be activated as described above when any one of a call list, an originating call list including information on originating calls, and a terminating call list including information on terminating calls is displayed. Furthermore, the address book search operation may be activated when the address book is displayed.

Also, in the case of using the method using hypertext as described above, the predetermined information may be prepared in hypertext, but it is understood that other information may not be prepared in hypertext. In the case of using the character recognition as described above, the character recognition operation is performed in accordance with a user's input when the predetermined information is displayed, while the character recognition operation may be intercepted even if the user's input is made when other information is displayed.

FIG. **7** is a flowchart illustrating a process of searching an address book according to another example embodiment of the present invention. Specifically, a method of activating the address book search operation according to the kind of information being displayed through the portable terminal **100** is illustrated in FIG. **7**. Referring to FIG. **7**, if the input unit **114** confirms a user's input for selecting a character (e.g., if the touch screen of the portable terminal **100** senses the contact of the pointing tool) in operation S**720** in a state that the display unit **112** displays information corresponding to the current function of the portable terminal **100** in operation S**710**, the control unit **130** determines whether the information being currently displayed is the predetermined kind of information in operation S**730**.

If the information being currently displayed is the predetermined kind of information (operation S**730**), the control unit arranges the address book in operation S**740** based on the selected character input in operation S**720**, and the display unit **112** displays the arranged address book in operation S**750**. By contrast, if the information being currently displayed is not the predetermined kind of information (operation S**730**), the control unit **130** disregards the input through the input unit **114** in operation S**720**, or controls the portable terminal **100** so that an operation corresponding to the current operational mode is performed in accordance with the input through the input unit **114**.

As described above, in the method of searching an address book and a portable communication device using the same according to aspects of the present invention, the search of the address book stored in the portable communication device can be easily performed.

While there have been illustrated and described what are considered to be example embodiments of the present invention, it will be understood by those skilled in the art and as

technology develops that various changes and modifications, may be made, and equivalents may be substituted for elements thereof without departing from the true scope of the present invention. Many modifications, permutations, additions and sub-combinations may be made to adapt the teachings of the present invention to a particular situation without departing from the scope thereof. For example, the portable communication device may include a storage unit to store the address book, or may only display an address book that is accessed from a server or another device. Furthermore, the arranged address book may firstly display names corresponding to the selected character, or may only display names corresponding to the selected character. Accordingly, it is intended, therefore, that the present invention not be limited to the various example embodiments disclosed, but that the present invention includes all embodiments falling within the scope of the appended claims.

What is claimed is:

1. A method of searching an address book in a portable communication terminal, the method comprising:

detecting a touch input of at least one character displayed on a touch screen, wherein the at least one character is associated with a call list;

generating a link information corresponding to the detected at least one character;

performing a search function of the address book by using the link information on the detected characters;

arranging the address book in accordance with arrangement instructions linked to the detected character,

wherein each individual detected character of a name in the call list linked to different contact name respectively, starting with the first corresponding detected character of a name,

mapping each detected character of a name on link information on the address book and sorting the name associated with detected character in descending order; and

displaying the searched address book in accordance with the link information,

wherein the link information is set for activating the search function of the address book.

2. The method as claimed in claim **1**, wherein the searched address book firstly lists names starting with the detected character.

3. The method as claimed in claim **1**, wherein the information displayed on the touch screen is an originating call list, a terminating call list, a call list including both the originating call list and the terminating call list, or the address book.

4. The method as claimed in claim **1**, wherein:

the at least one character displayed on the touch screen is linked to corresponding arrangement instructions.

5. The method as claimed in claim **4**, wherein the at least one character included in the displayed information is a hypertext character.

6. The method as claimed in claim **1**, wherein the detecting a touch input comprises:

capturing an image within a predetermined range around a point selected by a user on the touch screen; and

recognizing a character included in the captured image as the detected character.

7. The method as claimed in claim **1**, wherein the arranging of the address book comprises arranging the address book in a descending-order arrangement or an ascending-order arrangement in accordance with an order of characters.

8. The method as claimed in claim **1**, wherein the at least one character is detected through an input on the touch screen.

9. The method as claimed in claim **1**, wherein the arranged address book only lists names starting with the detected at least one character.

10. The method as claimed in claim **1**, further comprising:

disregarding the detected at least one character in response to the detected at least one character not being from a predetermined information.

11. The method as claimed in claim **1**, wherein the touch screen comprises a display unit to display the information and an input unit, physically distinct from the display unit, to receive an input of at least one character selected from the displayed information.

12. The method as claimed in claim **1**, wherein the arranging of the address book comprises arranging the address book according to a next character to the detected at least one character in response to the address book not including any names starting with the detected at least one character or any names including the detected at least one character.

13. A non-transitory computer-readable recording storage medium storing a program comprising:

detecting a touch input of at least one character displayed on a touch screen, wherein the at least one character is associated with a call list;

generating a link information corresponding to the detected characters;

performing a search function of the address book by using the link information on the detected characters;

arranging the address book in accordance with arrangement instructions linked to the detected character,

wherein each individual detected character of a name in the call list linked to different contact name respectively, starting with the first corresponding detected character of a name,

mapping each detected character of a name on link information on the address book and sorting the name associated with detected character in descending order; and

displaying the searched address book in accordance with the link information,

wherein the link information is set for activating the search function of the address book.

14. The method as claimed in claim **1**, wherein the at least one character displayed on the touch screen is included in a predetermined information, the predetermined information comprising a link mapped to the detected at least one character.

15. The method as claimed in claim **1**, wherein the detecting of the touch comprises detecting a finger touch or a stick touch.

16. The method as claimed in claim **1**, further comprising activating the portable communication terminal based on a predetermined information.

17. A portable communication device providing an electronic address book, the portable communication device comprising:

an input unit configured to detect a touch of at least one character displayed on a display, wherein the at least one character is associated with a call list;

a processor configured to generate a link information corresponding to the detected characters, and perform a search function of the electronic address book in accordance with the detected at least one character, acid-arrange the electronic address book in accordance with arrangement instructions linked on the detected at least one character wherein each individual detected character of a name in the call list linked to different contact name respectively, starting with the first corresponding detected character of a name, and map each detected

character of a name on link information on the address book and sorting the name associated with detected character in descending order; and

the display configured to display the electronic address book,

wherein the link information is set for activating a search function of the address book.

18. The portable communication device as claimed in claim **17**, wherein the arranged electronic address book firstly lists names starting with the detected character.

19. The portable communication device as claimed in claim **17**, wherein the displayed information is an originating call list, a terminating call list, a call list including both the originating call list and the terminating call list, or the address book.

20. The portable communication device as claimed in claim **17**, wherein:

the at least one character displayed on the display is linked to corresponding arrangement instructions.

21. The portable communication device as claimed in claim **20**, wherein the at least one character included in the displayed information is a hypertext character.

22. The portable communication device as claimed in claim **17**, wherein the processor comprises:

a capturing unit configured to capture an image within a predetermined range of a point of the touch;

a character recognition unit configured to recognize a character included in the captured image as the detected character; and

an arrangement unit configured to arrange the electronic address book based on the recognized character.

23. The portable communication device as claimed in claim **17**, wherein the processor is configured to arrange the electronic address book in a descending-order arrangement or an ascending-order arrangement in accordance with an order of characters.

24. The portable communication device as claimed in claim **17**, wherein the display is a touch screen, and the at least one character is detected through an input on the touch screen.

25. The portable communication device as claimed in claim **17**, wherein the arranged electronic address book only lists names starting with the detected at least one character.

26. The portable communication device as claimed in claim **17**, wherein the processor configured to disregard the detected at least one character if the detected at least one character is not from a predetermined information.

27. The portable communication device as claimed in claim **17**, further comprising an input unit, physically distinct from the display, configured to receive an input of at least one character selected from the displayed information.

28. The portable communication device as claimed in claim **17**, wherein the processor is configured to arrange the electronic address book according to a next character to the detected at least one character in response to the electronic address book not including any names starting with the detected at least one character or any names including the detected at least one character.

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